

AMENDMENTS TO THE CLAIMS

1. (currently amended) An implantable microstimulator, comprising:
 - an hermetically-sealed housing ~~having a length no greater than about 27 mm and cross-sectional dimensions no greater than about 3.3 mm;~~
 - an electronic subassembly housed within ~~said the~~ hermetically-sealed housing;
 - ~~a self-contained~~ power source ~~means~~ contained within ~~said the~~ hermetically-sealed housing and operatively connected to ~~said the~~ electronic subassembly for providing operating power to ~~said the~~ electronic subassembly;
 - a first electrode and a second electrode for stimulating tissue, each electrode external to ~~said the~~ hermetically-sealed housing and electrically coupled to ~~said the~~ electronic subassembly;
 - ~~a second electrode external to said hermetically-sealed housing and electrically coupled to said electronic subassembly;~~
 - an antenna coil within ~~said the~~ hermetically-sealed housing and electrically coupled to the electronic subassembly; and
 - telemetry ~~means~~ circuitry; coupled to ~~the said~~ antenna coil; for allowing data-containing signals to be received from ~~an~~ at least one external device, said telemetry ~~means~~ circuitry comprising
 - a first telemetry receiver for receiving data in accordance with a first telemetry scheme, and
 - a second telemetry receiver for receiving data in accordance with a second telemetry scheme.
2. (original) The implantable microstimulator of Claim 1 wherein the electronic subassembly includes a ferrite core around which the antenna coil is wrapped.

3. (original) The implantable microstimulator of Claim 2 wherein the ferrite core includes a first half and a second half.
4. (original) The implantable microstimulator of Claim 2 wherein the first telemetry scheme comprises a binary frequency shift key (BFSK) scheme wherein a binary "1" is represented by a transmitted signal of a first frequency F1, and wherein a binary "0" is represented by a transmitted signal of a second frequency F2.
5. (original) The implantable microstimulator of Claim 4 wherein the first telemetry receiver includes a capacitor for tuning the antenna coil wrapped around the ferrite core to a frequency that is close to both the first frequency F1 and the second frequency F2, whereby both the first frequency F1 and the second frequency F2 may be received through the antenna coil with minimal degradation.
6. (original) The implantable microstimulator of Claim 5 wherein the first telemetry receiver includes a mixer circuit and a local oscillator circuit, and wherein the local oscillator circuit generates a local oscillator signal having a frequency F3, and wherein the received BFSK signal is mixed with the local oscillator signal at the mixer circuit to produce a difference signal, and wherein the local oscillator signal F3 is approximately mid way between the frequency F1 and F2.
7. (original) The implantable microstimulator of Claim 6 wherein the first frequency F1 is about 131 KHz, and the second frequency F2 is about 123 KHz, and the frequency F3 of the local oscillator signal is about 127 KHz.
8. (currently amended) The implantable microstimulator of Claim 4 wherein the second telemetry scheme comprises an ON-OFF-KEY (OOK) Pulse Width Modulation (PWM) scheme, ~~wherein a binary "0" is represented by a first pulse width PW1 and a binary "1" is represented by a second pulse width PW2, and wherein a transition between one data bit and an adjacent data bit is marked by a change in a transmitted data signal from an ON to an~~

~~OFF state, or from an OFF to an ON state, wherein the ON state is characterized by the presence of a data signal having a frequency F1', and wherein the OFF state is characterized by the absence of the data signal.~~

9. (currently amended) The implantable microstimulator of Claim 8 wherein the telemetry ~~means circuitry~~ further includes ~~means transmission circuitry~~ for transmitting a signal to the external device in accordance with the BFSK telemetry scheme.

10-16. (canceled)

17. (currently amended) An implantable microstimulator, comprising
an hermetically-sealed housing ~~having a length no greater than about 30 mm and cross-sectional dimensions no greater than about 3.7 mm;~~
an electronic subassembly housed within ~~said the~~ hermetically-sealed housing;
~~a self-contained~~ power source ~~contained means within said the~~ hermetically-sealed housing and operatively connected to ~~said the~~ electronic subassembly for providing operating power to ~~said the~~ electronic subassembly;
first and second electrodes external to ~~said the~~ hermetically-sealed housing and electrically coupled to ~~said the~~ electronic subassembly;
an antenna ~~coil within said the~~ hermetically-sealed housing; and
telemetry ~~means circuitry~~, coupled to ~~said the~~ antenna ~~coil~~, for allowing data-containing signals to be received from ~~and sent to~~ at least ~~two~~ one external units through a first radio frequency (RF) telemetry link, and for allowing data-containing signals to be received from at least one external unit through a ~~n electromagnetic~~ second inductive telemetry link;
~~whereby two separate telemetry links are provided for communicating with the implantable microstimulator.~~

18. (currently amended) The implantable microstimulator of Claim 17 wherein the RF telemetry link comprises a binary frequency shift key (BFSK) telemetry link ~~wherein a binary "1" is represented by a RF signal having a frequency F1, and wherein a binary "0" is represented by the RF signal having a frequency F2.~~

19. (canceled)

20. (currently amended) The implantable microstimulator of Claim 18 wherein the electromagnetic inductive telemetry link comprises an ON-OFF-KEY Pulse Width Modulation (OOK-PWM) telemetry link ~~wherein a binary "0" is represented by a first pulse width PW1 and a binary "1" is represented by a second pulse width PW2, and wherein a transition between one data bit and an adjacent data bit is marked by a change in a transmitted data signal from an ON to an OFF state, or from an OFF to an ON state, wherein the ON state is characterized by the presence of a data signal having a frequency F1', and wherein the OFF state is characterized by the absence of the data signal.~~

21. (new) An implantable microstimulator, comprising:
an hermetically-sealed housing;
a first electrode and a second electrode for stimulating tissue, each electrode external to the hermetically-sealed housing;
an antenna within the hermetically-sealed housing; and
telemetry circuitry coupled to the antenna for receiving data-containing signals from at least one external device, said telemetry circuitry comprising
a first telemetry receiver for receiving data in accordance with a first telemetry scheme, and
a second telemetry receiver for receiving data in accordance with a second telemetry scheme.

22. (new) The implantable microstimulator of Claim 21 wherein the antenna is wrapped around a ferrite core.
23. (new) The implantable microstimulator of Claim 22 wherein the ferrite core includes a first half and a second half.
24. (new) The implantable microstimulator of Claim 22 wherein the first telemetry scheme comprises a binary frequency shift key (BFSK) scheme.
25. (new) The implantable microstimulator of Claim 21 wherein the first telemetry receiver includes a capacitor for tuning the antenna to a frequency that is close to both a first frequency F1 and a second frequency F2, whereby both the first frequency F1 and the second frequency F2 may be received through the antenna coil with minimal degradation.
26. (new) The implantable microstimulator of Claim 25 wherein the first telemetry receiver includes a mixer circuit and a local oscillator circuit, and wherein the local oscillator circuit generates a local oscillator signal having a frequency F3, and wherein the received BFSK signal is mixed with the local oscillator signal at the mixer circuit to produce a difference signal, and wherein the local oscillator signal F3 is approximately mid way between the frequency F1 and F2.
27. (new) The implantable microstimulator of Claim 24 wherein the second telemetry scheme comprises an ON-OFF-KEY (OOK) Pulse Width Modulation (PWM) scheme.
28. (new) The implantable microstimulator of Claim 24 wherein the telemetry circuitry further includes transmission circuitry for transmitting a signal to the external device in accordance with the BFSK telemetry scheme.